JAPAN

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JIS B 6545 (1991) (English): Drum sanders -- Test and inspection methods

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The citizens of a nation must honor the laws of the land.

Fukuzawa Yukichi

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JIS

JAPANESE INDUSTRIAL STANDARD

Drum sanders — Test and inspection methods

JIS B 6545—1991

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JAPANESE INDUSTRIAL STANDARD J I S

Drum sanders - Test and inspection methods B 6545-1991

1. Scope

This Japanese Industrial Standard specifies the test methods relating to the functions, running performances and rigidities, and to the accuracy and machining accuracy inspection methods of the drum sanders of which effective lengths([1]) of drums are 1100 mm or over to 2000 mm or under.

Note ([1]) The maximum width of grindable workpieces.

Remarks 1. The drum sander means the machine which grinds the surfaces of plywood and the like being fed automatically by the abrasive cloths and paper which are wound around the outer peripheral faces of rotating drums. Mostly the machine consists of two pieces of drum or more (see JIS B 0114).

2. The applicable standards to this Standard are as given in the following:

JIS B 0114-Glossary of Terms for Wood Working Machinery.

JIS B 0905-Balance Quality Requirements of Rigid Rotors

JIS B 6507-General Code of Safety for Wood Working Machinery.

JIS B 6521-Methods of Measurement for Noise Emitted by Wood Working Machinery.

JIS R 6251-Abrasive Cloths

JIS R 6252-Abrasive Papers

3. The units and numerical values given in { } in this Standard are in accordance with the traditional units, and are appended for informative reference.

2. Function test methods

The functional tests of drum sanders shall be in accordance with Table 1.

Table 1. Function test

No.	Test items	Test method
1	Electric equipments	Before and after the running test, examine insulating conditions once each.
2	Start, stop and running operation of drum	Carry out 10 times start and stop repeatedly at an appropriate rotational speed of the drum to examine the smoothness and reliability of actions.
3	Changing operation of rotational speeds of drum	Change rotational speed of the drum on overall rotational speeds of marking to examine the smoothness of actions and reliability of indications of the operating device.
4	Start, stop and running operation of feed device	At an appropriate feed speed, carry out start and stop 10 times repeatedly to examine the smoothness and reliability of actions.
5	Changing operation of feed speeds	Change speed on overall feed speeds of marking; and for the variable speed type, change speed on three feed speeds, lowest, intermediate and highest feed speeds to examine the smoothness of actions and the reliability of indications of the operating device.
6	Operations of up and down and clamping of table	Raise and lower the table to examine the smoothness and uniformity of actions thoroughly. For the center and both ends of the motion, examine the reliability of clamping and the smoothness of actions of the clamping device.
7	Cross slide of drum	Raise and lower the drum to examine the smoothness of actions and reliability of indications thoroughly.
8	Attaching and detaching of abrasive paper and cloth	Examine the smoothness and reliability of attaching and detaching of abrasive paper and cloth.
9	Brushing device	Examine the smoothness and reliability of the function.
10	Safety device	Examine the reliability of the safety function for workers and protective function for machine (see JIS B 6507).
11	Lubricating device	Examine the reliability of the functions such as oil-tightness, proper distribution of the oil quantity.
12	Accessory device	Examine the reliability of the functions.

Remarks: For the drum sanders which are not provided with the said functions, the corresponding test items to these in Table 1 may be omitted.

3. Running test methods

3.1 No-load running test Rotate the drum, continue running it for 30 to 60 minutes, measure the required electric power and noise after the bearing temperatures have been stabilized, and record on each item specified in the Recording Format 1 of Table 2 and check for abnormal vibration by touch.

The measurement of the noise shall be in accordance with JIS B 6521.

Table 2. Record format 1

Time of measurement h.min.	Rotational speed of drum r/min (rpm) Marked	Rotational speed of drum r/min (rpm) Measure	Feed rate m/min	Rotational speed of brush r/min (rpm)	Bearing temperatures (°C) Drums Front	Bearing temperatures (°C) Drums Rear	Bearing temperatures (°C) Feed roll	Bearing temperatures (°C) Brush	Required electric power Voltage V	Required electric power Current A	Required electric power Input kW	Noise dB (A)	Room temperature °C	Description

Remarks 1. For the drum sander provided with the variable speed device for rotational speeds of the drum, it shall be recorded on the rotational speeds of at least two conditions including the maximum rotational speed.

2 The measuring conditions of noise shall be recorded in the description column.

3.2 Load running test Grind the test specimen, measure the required electric power and noise to record on each item specified in Recording Format 2 of Table 3., and check for abnormal vibration and conditions of the ground surface by touch.

For the measurement of the required electric power, test shall be carried out by changing the depth of cut at a definite feed speed or changing the feed speed at a definite depth of cut.

The measurement of noise shall be in accordance with JIS B 6521.

Table 3. Record format 2

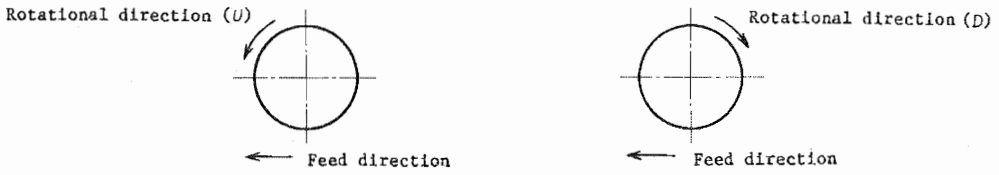
No.	Test specimen: Dimension: Length mm	Width mm	Thickness mm	Species of tree or type of wood	Surface conditions before and after grinding	Moisture content %	Abrasive cloth and paper(2): Properties of abrasives	Particle size of abrasives	Width mm	Grinding conditions: Rotational speed of drum r/min (rpm)	Feed rate m/min	Depth of cut(3) mm	Rotational direction of drum(4)	Ground quantity mm	Required electric power: Voltage V	Current A: Drum	Current A: Feed device	Input: No-load P_0 kW: Drum	Input: No-load P_0 kW: Feed device	Input: Load P_1 kW: Drum	Input: Load P_1 kW: Feed device	Grinding powers $P_1 - P_0$ kW: Drum	Grinding powers $P_1 - P_0$ kW: Feed device	Noise dB (A)	Humidity %	Description

Notes ([2]) It shall be in accordance with the indicating methods of JIS R 6251 and JIS R 6252.

([3]) It shall be indicated by the change of intervals between the drum and the table.

([4]) In the column of the rotational direction of drum, a symbol shall be described in accordance with Fig. 1.

Fig. 1. Rotational direction of the drum

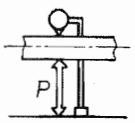


Remarks: The measuring conditions of noise shall be recorded in the description column.

4. Rigidity test method

The rigidity test on the drum sanders shall be in accordance with Table 4.

Table 4. Rigidity test

No.	Test item	Measuring method	Diagram of measuring method
1	Rigidity of drum and table	Apply the test indicator fixed to the table to the center of the drum, apply the load (P) in vertical direction between the drum and the table([5]), and measure the relative displacement between the drum and the table.	

Note ([5]) The position where the load is applied shall be as near to the center of the drum as possible, and the distance from the fixed end of the drum shall be recorded.

Remarks 1. The rigidity test of the machines of the same design shall be represented by the test results on a representative set, and on others, may be omitted.

2. The magnitude of the load (P) shall be the recommended value by the manufacturer, and its value shall be recorded.

3. This measurement shall be made when the bearing temperature is stabilized after rotating the drum.

5. Accuracy inspection method

5.1 Static accuracy inspection The static accuracy inspection of the drum sanders shall be in accordance with Table 5.

Table 5. Static accuracy inspection

Unit: mm

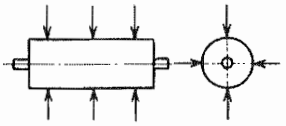
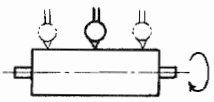
No.	Inspection item	Measuring method	Diagram of measuring method	Permissible value	
				Effective length of drum	
				1400 or under	Exceeding 1400
1	Cylindricity of drum	Among the maximum differences of the diameters of the drum(6) which have been measured respectively in two planes vertical to each other, including the shaft, consider the larger value as the measured value. The measurement shall be made at three places or more at least at the center and both ends(7) of the drum.		0.04	0.06
2	Run out of drum	Apply a test indicator to the outer peripheral surface of the drum(6), rotate the drum manually and consider the maximum difference of the readings of the test indicator during rotation as the measured value. The measurement shall be made at three places, the center and both ends(7) of the drum.		0.04	0.06

Table 5. (Continued)

Unit: mm

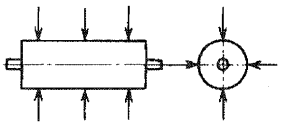
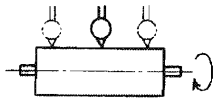
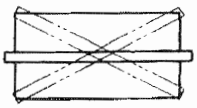
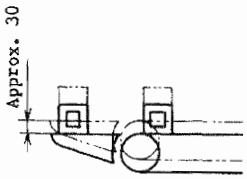
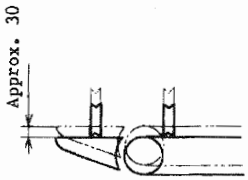
No.	Inspection item	Measuring method	Diagram of measuring method	Permissible value	
				Effective length of drum	
				1400 or under	Exceeding 1400
3	Cylindricity of feed roll	Among the maximum differences of the diameters of the feed roll which have measured respectively in two planes vertical to each other, including the shaft, consider the larger value as the measured value. The measurement shall be made at three places or more, at least at the center and both ends(7) of the feed roll.		0.05	0.07
4	Run out of feed roll	Apply a test indicator to the outer peripheral surface of the feed roll, rotate the feed roll manually, and consider the maximum difference of the readings of the test indicator during the rotation as the measured value. The measurement shall be made at the center and both ends(7) of the feed roll.		0.05	0.07

Table 5. (Continued)

Unit: mm

No.	Inspection item		Measuring method	Diagram of measuring method	Permissible value	
					Effective length of drum	
					1400 or under	Exceeding 1400
5	Straightness of surface of table		Place a straightedge on the surface of the table in vertical direction to the feed direction and on diagonal lines, measure the clearances with a feeler gauge, and consider the maximum value thereof as the measured value.		0.03 per 1000	
6	Parallelism of up-and-down motion of table	In back and forward directions	Place a precision level in parallel to the feed direction of the surface of the table, raise the table to approx. 30 mm from the lower position, and consider the maximum difference of the readings of the precision level during the time as the measured value.		0.03/m	
		In right and left directions	Place a precision level in vertical to the feed direction of the surface of the table, raise the table to approx. 30 mm from the lower position, and consider the maximum difference of the readings of the precision level during the time as the measured value.		0.03/m	

Notes ([6]) For the drum which is to be attached with the cushioning body of felt, foam rubber or the like, the measurement shall be made prior to the attachment.

([7]) Measurement shall be made avoiding the portion "shear drop".

Remarks: For the drum sanders which are not provided with the said functions, the corresponding inspection items to these in Table 5 may be omitted.

5.2 Dynamic accuracy inspection The dynamic accuracy inspection of the drum sanders shall be in accordance with Table 6.

Table 6. Dynamic accuracy inspection

Unit: mm/s

No.	Inspection item	Measuring method	Permissible value
1	Quality of balance of drum	Measure the magnitude of unbalance by a balance tester, obtain the magnitude of specific unbalance from the mass of the drum, and calculate the quality of balance (B) from the rotational speed([8]). $B=\frac{en}{9.55}$ where e : magnitude of specific unbalance (mm) n : rotational speed (r/min {rpm})	6.3

Note ([8]) It shall be the two-plane balancing (see JIS B 0905).

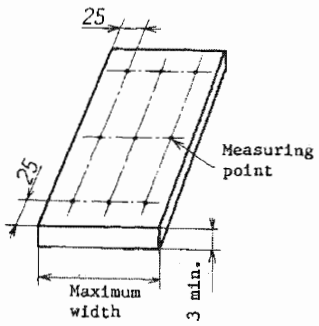
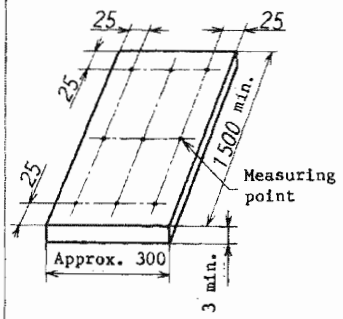
Informative reference: The permissible value of No. 1 is the grade G 6.3 of the quality of balance in JIS B 0905.

6. Machining accuracy inspection method

The machining accuracy inspection of the drum sanders shall be in accordance with Table 7.

Table 7. Machining accuracy inspection

Unit: mm

No.	Inspection item		Measuring method	Diagram of measuring method	Permissible value	
					Effective length of drum	
					1400 or under	Exceeding 1400
1	Accuracy of thickness	Type of machine intended for regulating thickness	Grind the test specimen having the thickness approximately equal to the maximum grindable width of the machine, measure the thicknesses of measuring points(9) by an outside micrometer, and consider the maximum difference thereof as the measured value.		0.08	0.10
		Type of machine not intended for regulating thickness	Grind the test specimen(s) of which the thickness of the measuring points (9) have been measured by the outside micrometer after arranging the specimen(s) in parallel to the grindable maximum width of the machine, measure the thickness of the measuring points by the outside micrometer, and consider the subtracted value of the maximum difference thereof from the maximum difference before grinding as the measured value.		It shall not be negative.	

Note (9) The measuring points shall be in accordance with the diagram of measuring method.

Remarks 1. For the drum sander which is not provided with the said function, the inspection item corresponding to this in Table 7 may be omitted.

2. The test specimen shall be subjected to the necessary pre-processing.

3. The abrasive cloths and paper shall be those recommended by manufacturer.

Reference Standards:

JIS B 6501-Test Code for Performance and Accuracy of Wood Working Machinery

JIS R 6004-Glossary of Terms and Marks Used in Abrasive, Grinding Wheel and Coated Abrasive

JIS Z 8203-SI Units and the Use of Their Multiples and of Certain Other Units

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